



## EXPECTED SEISMIC ACTION IN ALMERIA AND GRANADA CITIES (SOUTHERN SPAIN) COMBINING REGIONAL-AND LOCAL-SCALE INFORMATION

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### Abstract

A hybrid approach that relates results from a regional seismic hazard assessment study with local-scale site-effect characterizations is presented (Figure 1) and applied to Almeria and Granada (Southern Spain). Results of a regional-scale probabilistic seismic hazard analysis of Southern Spain on rock conditions are disaggregated to infer hazard controlling earthquakes for different target motions. A collection of controlling magnitude-distance pairs and the corresponding site-specific response spectra at main capital cities of the region is obtained. These spectra are first-order approximations to expected seismic actions required in local earthquake risk assessments. In addition, results of independent, local-scale studies mapping predominant soil periods are used to show areas where period-dependent resonant effects are likely to occur. If a local seismic risk assessment study or an earthquake-resistant structural design is to be developed, it is recommended to use different seismic actions on sites characterized by distinct predominant periods. A worst-case scenario may be anticipated when a hazard-consistent response spectrum, obtained by hazard deaggregation at the spectral acceleration which period matches the prevailing resonant period of the target site, is used as seismic action. Two examples from sites at the cities of Almeria and Granada are used to illustrate this approach.

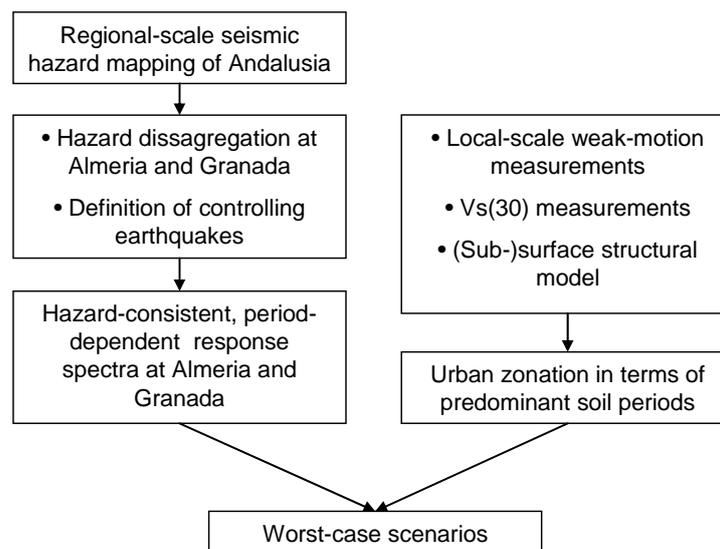


Figure 1: Approach to worst-case scenarios using regional-scale results (left) and local-scale data (right).